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ABSTRACT

Effects of experimental learning environments on students' perceptions of themselves and others were evaluated using a nonverbal self-social constructs test. Data were collected from 4000 students representing elementary schools with traditional or experimental learning environments. The experimental environments allowed parents and students to choose among multiple program options. The Self Social Constructs Test (SSCT) was used to evaluate six psycho-social dimensions of students: self-esteem, social distance from others in the school environment, scope of peer attachment, social interest, perceived inclusion, and perceived individuation. The SSCT employed spatial symbols (circles and lines) to represent self and social situations. By selecting and/or arranging symbols, students provided spatial maps interpretable for perceived relationships between themselves and others such as peers, parents, and teachers. Analyses of variance employing school type, grade, ethnicity, and sex as independent factors supported the following conclusions. Students in the multiple-option system perceived themselves as closer to their teachers, more attached to peers, and more included in the domain of social influence. They also retained a stronger sense of individuality. (Author/AV)

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THE IMPACT OF MULTIPLE EDUCATIONAL OPTIONS ON STUDENTS' SELF AND SOCIAL PERCEPTIONS

By Tora Kay Bikson

The Rand Corporation, Santa Monica, California

April 1977

The research summarized here is aimed at evaluating the noncognitive effects of an educational voucher demonstration in a low income multicultural school district. We have assumed that the character of students' experiences may be sensitive to educational change, and may show the impact of variation in educational practice, well before such changes noticeably alter long-standing achievement patterns. In 1972, Alum Rock (California) initiated such a demonstration. Schools in the experimental condition divided themselves into minischools and undertook explicitly to provide a large number of different kinds of educational programs; parents and students were permitted to choose, among multiple options, the learning environments they thought best suited their needs. The remaining District schools retained their traditional organization and programs. In 1975, after the demonstration had been fully implemented, we sought to determine how, if at all, students in experimental versus traditional learning environments differed in the way they construed themselves and their social milieu. A secondary and related objective was to find a multiculturally valid method of assessing important psychosocial dimensions that would be independent of achievement variables.

These objectives gain significance in view of two assumptions which underlie the study. First, we concur with recent research which links cognitive and affective growth; school achievement is thought to be mediated by how the student perceives and values himself and significant others in the school environment. Second, and of greater importance, we take these concerns to be of intrinsic interest, independently of any contribution they may make to academic success. That is, the psychosocial dimensions of school experience are regarded as outcomes meriting investigation per se. Specifically, we suppose that the self-concept is an agent through which social experiences are processed; consequently it mediates assimilation of and accomodation to the changing school environment. Further, our theoretical perspective includes the premise that the meaning of self actually evolves in a social context and so is an essentially relational notion. In particular, the development of a concept of self turns on becoming aware of and responding to similarities and differences between the self and others; in this interactive process, self-social constructs emerge, although they are not necessarily articulated. Finally, we believe that as children develop, self perception is facilitated by more and varied social experiences; moreover, the influence of such experiences is conditioned by cultural norms and the expectations of others. This theoretical framework, then yields a view of psychosocial variables that is situational, relational, and susceptible to significant change in contrast to perspectives that are trait-theoretic, intra-personal and static.

Given this view of the nature and importance of psychosocial dimensions in school experience, a major task was to find a method of

assessment congruent with our conceptual orientation. An extensive review of related literature yielded such a method in the Self Social Constructs Test (SSCT), a product of about 7 years of experimental work originally undertaken by social psychologist Robert Ziller and supported by grants from NSF, OE, and NIMH. Briefly, the SSCT employs spatial symbols to represent self and social schemata. Circles are used to represent persons, while spatial relations represent social relations (ordering, distance, and inclusion as well as sameness and difference are readily translated into spatial metaphors). By selecting and/or arranging symbols, the subject provides a spatial map interpretable for perceived relationships between the self and significant others. However, properties of the map are objectively scoreable. Scores, for instance, represent how far the "self" circle is placed from the "teacher" circle; or, how many "peer" circles the "self" circle is connected; or, whether the "self" circle is selected so as to make it similar to or different from the majority or "peer" circles. Previous experimental work by Ziller and others establishes these procedures as both reliable and valid for assessing self-social constructs in school-aged subjects.[1]

Moreover, our own prior attempts at assessing psychosocial variables with standard survey instruments suggested the potential superiority of a nonverbal method. First, verbal responses were found to be heavily dependent on such factors as vocabulary and fluency, which in turn are related to age, sex, intelligence and achievement--so nonverbal

[1] Ziller, R.C., The Social Self, Pergamon Press, 1973.

measures would seem to be preferable if noncognitive outcomes are to be assessed independently of cognitive ones. Second, the meanings, particularly connotative aspects, of words vary from subculture to subculture, so that a common interpretation of verbal self-reports from students in a multicultural social environment would be difficult to insure. Finally, verbal self-reports are highly visible to the subject, so that socially desirable or otherwise consciously manipulated responses are very likely to occur--as evidenced by lack of response variability and by exceptionally high lie scale score in our own previous efforts with verbal instruments. For these reasons, we developed a form of the SSCT for use in evaluating outcome differences between experimental- and traditional-school students along psychosocial dimensions. Six dimensions were chosen for evaluation: self-esteem; social distance from significant others in the school environment; scope of peer attachment; social interest; perceived inclusion; and perceived individuation. Each item was repeated several times, varying irrelevant spatial attributes, so that scores on each dimension would represent consistent responses to critical features of the construct being assessed.

Data were collected from approximately 4000 elementary school students, virtually evenly divided among grades two, three, four and five, and balanced for sex. About half the students are chicano, about a fourth are white, and the remaining fourth represent other ethnic minorities (primarily black). The sample includes students from the 16 Alum Rock elementary schools, among which six are traditional schools; the other ten are experimental-schools comprised

of 36 minischools offering a range of innovative education programs. Sixty percent of the sample was drawn from these experimental sites. The SSCT was group-administered to students by their own classroom teachers using standardized instructions, a procedure typically requiring half an hour. Test booklets were then hand-scored by Rand staff. After examining intercorrelations among items within and between dimensions to establish that we were in fact assessing basically consistent responses to six discriminable constructs, the data were treated in analyses of variance. School type (experimental versus traditional), grade level, sex and ethnicity served as independent factors in the analyses, while summed scores representing each of the six self-social constructs provided the dependent measures.

The results, discussed briefly below, suggest that in many important respects these measures of the perceived social context differentiate experimental- from traditional-school students. Discussion of the results is supplemented by an appendix which contains sample test items and data tables. For each construct assessed, the item is given first along with the instructions read to students and an explanation of its scoring. Following the item is a table presenting results of the analysis of variance for the construct that item represents. The table gives cell means, along with group means for school type, grade level, and ethnicity. Under the table are listed values of F and associated probability levels for independent sources of variation; values of interaction terms are presented only when they are significant.

Self-esteem, or sense of self worth, was measured by asking a student to mark one circle to represent himself given either a vertical

column or horizontal row of circles. High esteem is indicated by selecting a circle high in the column, or a circle toward the left end of the row (this latter scoring is demonstrably valid in societies with left-to-right reading and writing styles). We found no significant differences in self esteem as a function of school type nor, we are pleased to report, as a function of sex or ethnicity. We did, however, discover that subjects in the higher grade levels ranked significantly lower in self esteem than did subjects in second and third grade ($F = 3.68$, $p \leq .01$).

Social distance from significant others in the school environment was measured using a row of circles. A circle at one end is marked to represent the target figure (teacher or peer); and the subject is asked to select another circle to represent himself. The obtained score is simply the distance the subject puts between himself and the target figure. While no independent factors appeared to influence distance from peers, school type had a strong impact on perceived distance from the teacher ($F = 6.43$, $p < .01$); students in experimental schools feel substantially closer to their teachers. In addition, effects emerged for both grade level and sex: younger students ($F = 5.99$, $p < .001$) and female students ($F = 21.74$, $p < .001$) perceive themselves as closer to their teachers than do their counterparts.

Scope of peer attachments was measured by providing the subject with a circle designated to stand for himself amid varying numbers of other circles standing for other students. The subject is asked to draw however many lines he likes connecting his circle with the others, the score being the number of others to which the self circle

is attached. This social construct differentiated students by school type ($F = 4.66$, $p < .03$; students in experimental schools indicated significantly more peer attachments. Again, it appeared that students in lower grades obtained significantly higher scores than students in higher grades ($F = 5.94$, $p \leq .001$). However, on this measure no sex effects emerged.

Social interest was assessed by presenting the subject with a social influence triangle formed from three circles representing parents, teachers and friends. The subject is instructed to draw a self circle anywhere on the page. The item is given a score indicating whether or not the subject located himself inside the triangle. On this dimension, students in experimental schools scored significantly higher than did students in traditional schools ($F = 3.48$, $p < .06$). Further, older students tended more often than younger students to locate themselves within the social influence triangle ($F = 5.19$, $p < .002$). And, on this measure, ethnicity exerted a significant influence as well ($F = 5.10$, $p < .002$). Specifically, white students obtained highest scores, followed by chicano students who comprise the ethnic majority; scoring lowest were black and other minority students.

Quite a different set of results appeared for the measure of inclusion or perceived group membership. This construct was assessed by providing a large geometric figure along with several circles, some inside the larger figure and others outside it. The score reflects whether or not the subject chose to represent himself as included. While neither school type nor grade level affected inclusion, both race and sex had a significant impact. Black and other minority students

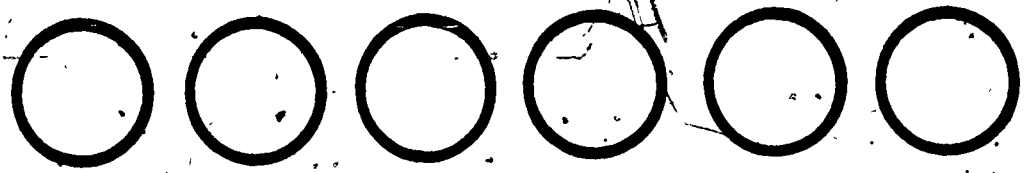
more strongly perceived themselves as members of a group ($F = 2.73$, $p < .08$), even though their minority status seemingly led them to place themselves outside the sphere of general social influence. In addition, female students were more likely than male students to see themselves as group members ($F = 4.98$, $p < .05$).

Finally, perceived individuation was assessed by asking the subject to choose a self circle from a collection of circles, a few of which differ from the majority of circles. The score indicates whether or not the subject chose a dissimilar circle. On this dimension school type exerted a significant effect ($F = 7.08$, $p < .008$), students in experimental schools more often perceiving themselves as individuals. A main effect also emerged for grade level, older students receiving higher individuation scores ($F = 4.85$, $p < .003$). Finally, two interaction effects should be noted. A significant school type by grade level interaction appeared, suggesting that, even in the lower grades, experimental school students obtain relatively high individuation scores ($F = 3.98$, $p < .008$). And a significant grade level by ethnicity interaction ($F = 1.98$, $p < .04$) indicated that perceived individuation emerges earlier for chicano, black and other minority students than it does among white students; not surprisingly, the effect is sharpest among students comprising the least numerous ethnic groups.

These results suggest that the varied learning environments introduced by the Alum Rock experiment led students to perceive themselves as being close to their teachers, as having a broad network of peer attachments, and as being a part of the sphere of

normal social influence without sacrificing a strong sense of individuality. Analysis of structured observation data collected from these same classrooms should enable us to determine what kinds of educational practices account for these outcomes. In the meantime, we can generally conclude that the introduction of diversity and choice among educational programs at the elementary school level has significant and positive effects on students' self-social construct systems. Further, these results suggest that the use of spatial symbols and relationships eliminates many verbal measurement problems. Variability of outcomes along different dimensions, as well as their consistency and interpretability, supports the validity of this method for assessing the impact of alternative educational programs on a number of important psychosocial construct domains.

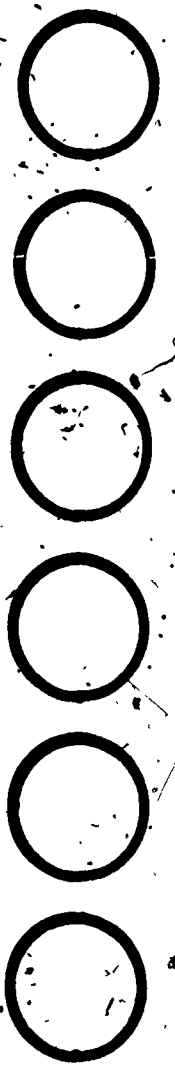
APPENDIX



Scoring: Scores vary from 1 to 6 points, depending on which circle is marked with the student's initial. The circle on the far left receives 6 points, the one next to it receives 5 points, and so on--the lowest score of 1 point goes to the circle on the far right of the row.

8. The circles in the row stand for people. You pick one to be you and put your initial in it. (self esteem)

Scoring: Scores vary from 1 to 6 points, depending on which circle is marked with the student's initial. The circle on the top receives 6 points, the next lowest receives 5 points, and so on--the bottom circle receives the lowest score of 1 point.



14. These circles stand for people. You pick out one to be you and put your initial in it. (self esteem)

Self esteem (range = 8 - 48)

Multiple option system: $\bar{x}$ = 30.9

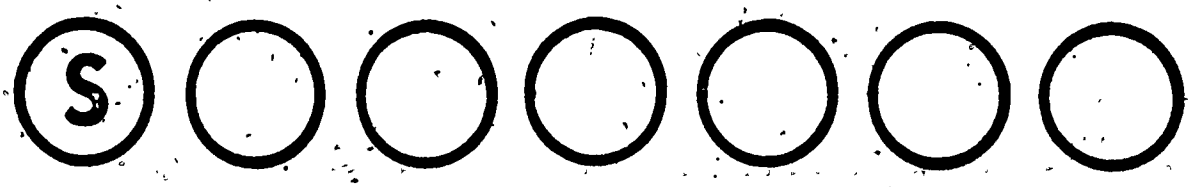
Traditional system: $\bar{x}$ = 30.7

Grade Level	White		Chicano		Black		Other		White		Chicano		Black		Other	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
2 $\bar{x}$= 31.6	31.3	31.6	31.7	31.6	33.0	31.6	31.1	33.1	30.5	30.5	31.4	29.9	33.2	32.0	29.2	33.0
3 $\bar{x}$= 31.2	32.3	30.5	31.1	30.9	31.8	33.7	29.2	31.6	30.9	29.3	30.5	31.7	31.9	31.4	33.1	28.9
4 $\bar{x}$= 30.3	30.0	31.4	30.1	30.9	31:0	29.6	29.1	31.3	30.9	31.1	30.0	32.3	30.8	29.7	27.2	29.2
5 $\bar{x}$= 30.2	29.8	30.1	28.6	30.1	30.3	30.5	29.9	29.1	29.8	30.2	29.9	29.7	30.9	31.1	32.0	30.8

White $\bar{x}$ = 30.6 Chicano $\bar{x}$ = 30.7 Black $\bar{x}$ = 31.4 Other $\bar{x}$ = 30.5

Source of variation	F	p
School type	0.20	N.S.
Ethnicity	1.42	N.S.
Sex	0.28	N.S.
Grade Level	3.68	p ≅ .01

Scoring: Scores vary from 1 to 6, representing how near the circle initialed by the student is to the S Circle. Scoring is done in exactly the same way, regardless of whether the S is at the right or left end of the row.



4. The circle with the S in it stands for other students. You choose one of the other circles to be you. Put your initial in it.
(social distance: peers)

Social distance: peers (range = 2 - 12)

Multiple option system: $\bar{x}$ = 6.3

Traditional system: $\bar{x}$ = 6.3

Grade Level	White M	White F	Chicano M	Chicano F	Black M	Black F	Other M	Other F	White M	White F	Chicano M	Chicano F	Black M	Black F	Other M	Other F
2 $\bar{x}$= 6.3	6.5	5.8	6.5	6.2	5.8	7.1	6.1	6.0	6.3	6.3	6.8	6.3	6.3	6.2	7.3	5.0
3 $\bar{x}$= 6.35	6.3	6.5	6.4	6.2	6.5	6.7	6.5	5.9	6.0	6.6	6.3	6.1	6.6	6.8	6.4	5.9
4 $\bar{x}$= 6.4	6.5	6.8	6.2	6.3	6.8	6.4	5.3	6.7	6.2	6.2	6.9	6.5	6.2	6.8	6.8	6.0
5 $\bar{x}$= 6.2	6.6	5.8	6.3	6.1	5.7	6.4	5.8	7.3	6.5	6.9	6.5	6.4	6.9	6.2	6.6	4.8

White $\bar{x}$ = 6.3 Chicano $\bar{x}$ = 6.4 Black $\bar{x}$ = 6.45 Other $\bar{x}$ = 6.1

Source of variation	F	p
School type		N.S.
Ethnicity		N.S.
Sex		N.S.
Grade Level		N.S.
(School type X sex	4.61	p < .05)

Scoring: Scores vary from 1 to 6, representing how near the circle initialed by the student is to the T circle. Scoring is done in exactly the same way, regardless of whether the T is at the right or left end of the row.

2. The circle with the T in it stands for your teacher. You choose one of the other circles to be you. Put your initial in it.
(social distance: teacher)

Social distance: teacher (range = 2 - 12)

Multiple option system: $\bar{x}$ = 6.1

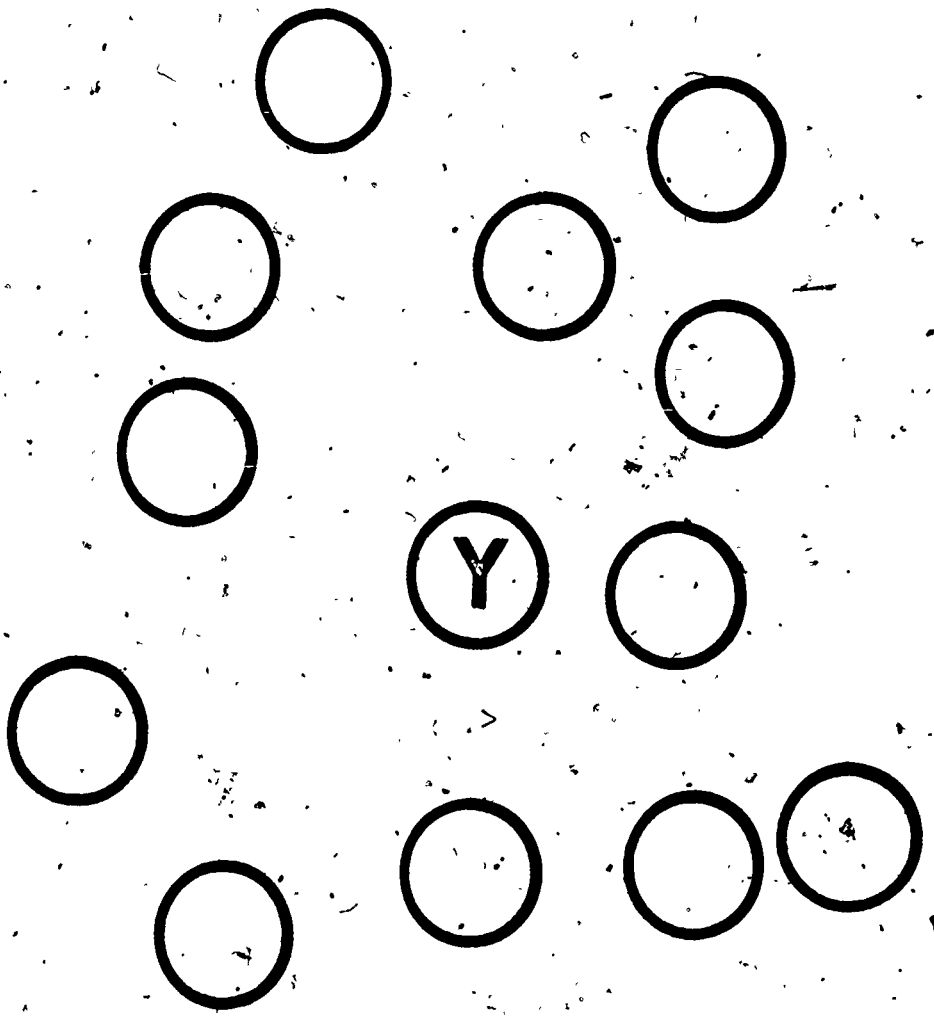
Traditional system: $\bar{x}$ = 6.5

Grade Level	White		Chicano		Black		Other		White		Chicano		Black		Other	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
2 $\bar{x}$= 5.9	5.3	5.2	6.2	5.4	6.2	6.2	6.2	4.6	6.7	5.6	6.8	6.0	6.6	6.8	7.0	4.3
3 $\bar{x}$= 6.3	6.1	5.1	6.1	5.3	6.5	5.4	6.9	6.2	6.4	5.9	6.9	5.8	7.4	6.4	8.2	5.6
4 $\bar{x}$= 6.2	6.5	6.1	7.0	5.8	7.2	6.0	6.4	6.1	7.3	4.7	6.1	6.3	5.5	6.7	6.1	6.2
5 $\bar{x}$= 6.8	6.8	6.2	6.9	6.2	6.1	6.5	6.4	7.1	7.6	5.8	7.5	7.1	7.7	6.6	6.6	7.9

White $\bar{x}$ = 6.08 Chicano $\bar{x}$ = 6.34 Black $\bar{x}$ = 6.48 Other $\bar{x}$ = 6.36

Source of variation	F	P
School type	6.43	p ≅ .01
Ethnicity	1.29	N.S.
Sex	21.74	p < .001
Grade Level	5.99	p < .001

Scoring: Scores vary from 0 to 12, depending on how many lines the student has drawn which originate from the Y circle and connect with another circle. A score of 0 indicates that the Y circle is not connected by a line to any other circle. Only one point can be awarded for connecting the Y circle to a given other circle (even if the student has drawn more than one line to that same circle). No extra points are given for lines connecting unmarked circles to each other.



16. The circle marked "Y" stands for Yourself. The other circles stand for other people. Draw as many or as few lines as you wish from the circle for Yourself to the circles which stand for other people.

(scope of peer attachment)

Scope of peer attachment (range = 0 - 24)

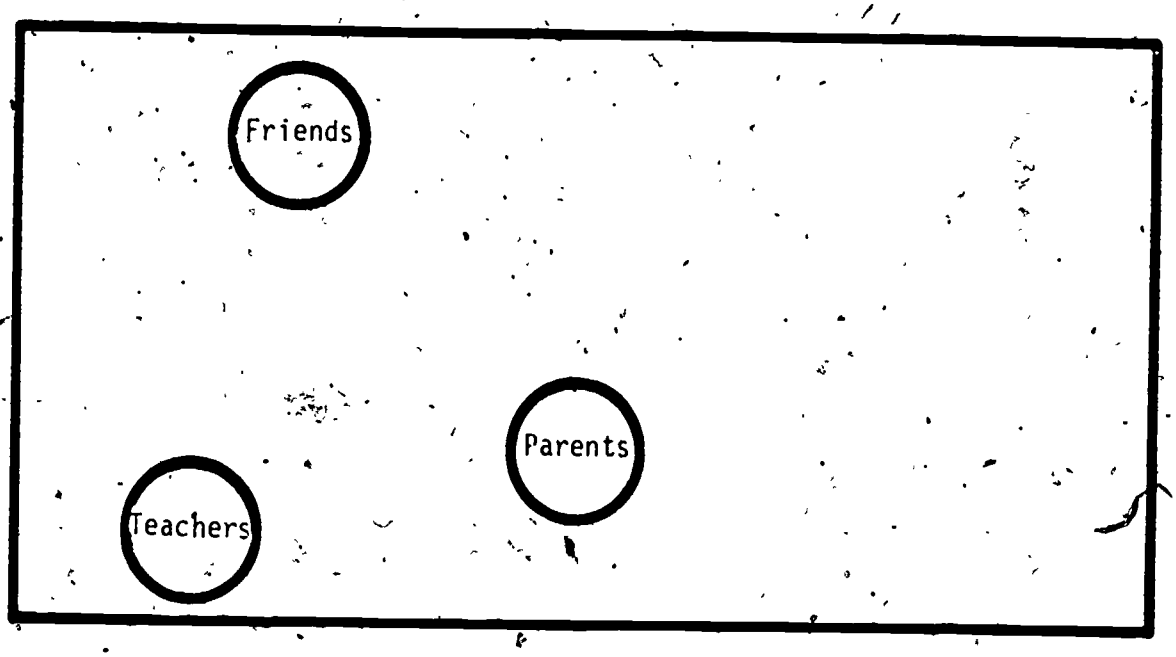
Multiple option system: $\bar{x}$ = 17.7 Traditional system: $\bar{x}$ = 17.1

Grade Level	White M	White F	Chicano M	Chicano F	Black M	Black F	Other M	Other F	White M	White F	Chicano M	Chicano F	Black M	Black F	Other M	Other F
2 $\bar{x}$= 17.8	18.7	18.1	18.6	18.4	19.8	18.8	19.6	19.6	18.7	18.3	17.6	16.5	17.2	14.9	15.8	14.3
3 $\bar{x}$= 18.0	18.1	18.5	17.9	17.5	19.4	17.8	18.4	15.9	17.7	17.7	17.1	18.0	16.9	16.7	20.6	19.7
4 $\bar{x}$= 17.2	19.3	16.7	16.9	17.1	17.5	19.4	15.7	14.3	17.4	16.7	17.0	16.7	17.8	16.0	16.3	20.5
5 $\bar{x}$= 16.5	17.7	16.2	17.4	16.1	15.9	17.4	16.2	16.8	16.2	15.6	16.5	15.5	16.8	17.4	15.1	17.8

White $\bar{x}$ = 17.60 Chicano $\bar{x}$ = 17.17 Black $\bar{x}$ = 17.47 Other $\bar{x}$ = 17.28

Source of variation	F	P
School type	4.66	p = .03
Ethnicity	0.48	N.S.
Sex	1.55	N.S.
Grade Level	5.94	p < .001
School type X ethnicity X grade	3.14	p < .001

Scoring: Scores on these items can only be 1 or 0, depending on where the student has drawn a circle to represent himself. If his circle falls anywhere inside the triangle formed by the other three circles standing for parent, teacher and friends, he receives a 1. If his circle falls outside that triangle, he receives 0. Circles count as within the triangle if they are at least touching the triangle. In cases where the scorer cannot tell simply by looking, he/she should draw lines with a ruler connecting the circles by tangents and determine whether these boundaries at least touch (or include a part of) the student's circle.



24. The circles above stand for your Parents, Teachers, and Friends. Draw a circle to stand for yourself anywhere in the space above. (social interest)

Social interest (range = 0 - 4)

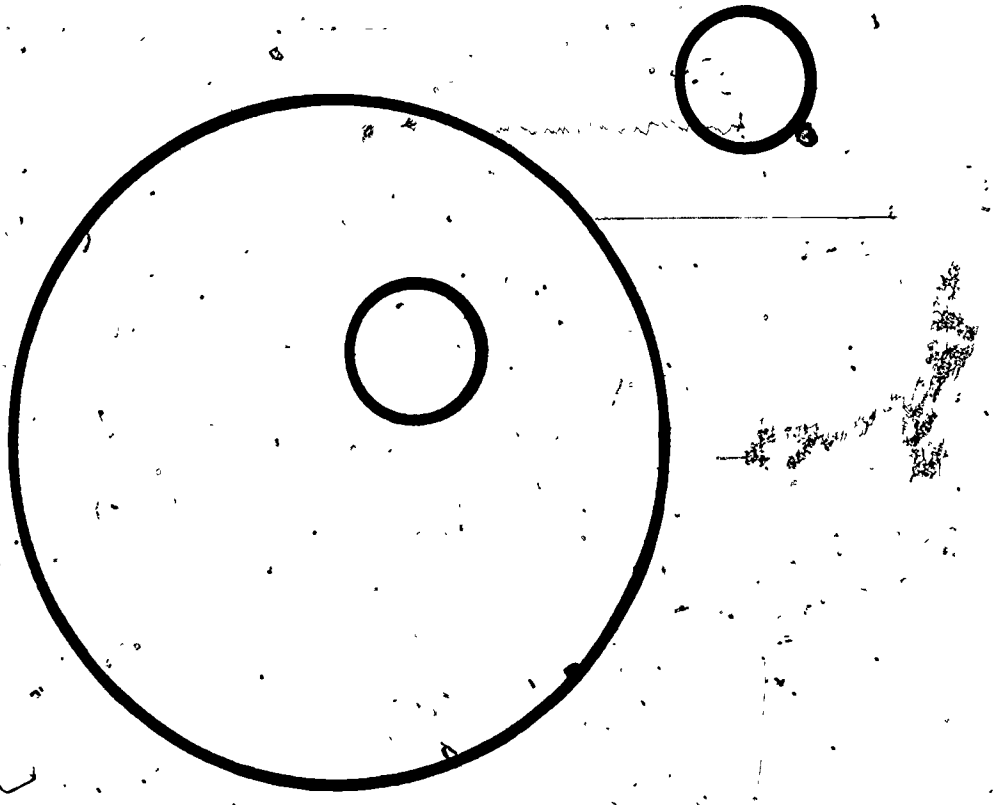
Multiple option system: $\bar{x}$ = 1.84 Traditional system: $\bar{x}$ = 1.70

Grade Level	White		Chicano		Black		Other		White		Chicano		Black		Other	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
2 $\bar{x}$= 1.77	1.85	2.38	1.71	1.81	1.52	1.31	2.63	1.47	1.57	1.87	1.57	1.83	1.93	1.73	1.83	1.38
3 $\bar{x}$= 1.63	1.99	2.14	1.68	1.76	1.44	1.78	1.89	1.86	1.93	1.60	1.60	1.54	1.11	1.33	1.29	1.13
4 $\bar{x}$= 1.69	1.67	2.15	1.59	1.66	2.0	1.51	1.39	1.73	1.92	2.15	1.53	2.04	1.48	2.10	1.0	1.22
5 $\bar{x}$= 2.0	2.55	2.05	1.98	1.92	1.89	1.87	1.38	2.35	2.34	2.05	1.54	2.07	1.65	2.15	2.0	2.11

White $\bar{x}$ = 2.01 Chicano $\bar{x}$ = 1.74 Black $\bar{x}$ = 1.67 Other $\bar{x}$ = 1.66

Source of variation	F	p
School type	3.48	p = .06
Ethnicity	5.09	p = .002
Sex	1.30	N.S.
Grade Level	5.19	p = .002

Scoring: Scores on these items can only be 1 or 0, depending on which circle the student has marked with an X. If the circle marked by X falls within the larger circle, the answer receives a score of 1. If the circle marked by X falls outside the larger figure, the answer receives a score of 0.



28. The small circles above stand for you and some other persons. Choose one of the small circles to stand for yourself. Put an X on it. (perceived inclusion)

Perceived group inclusion (range = 0 - 4)

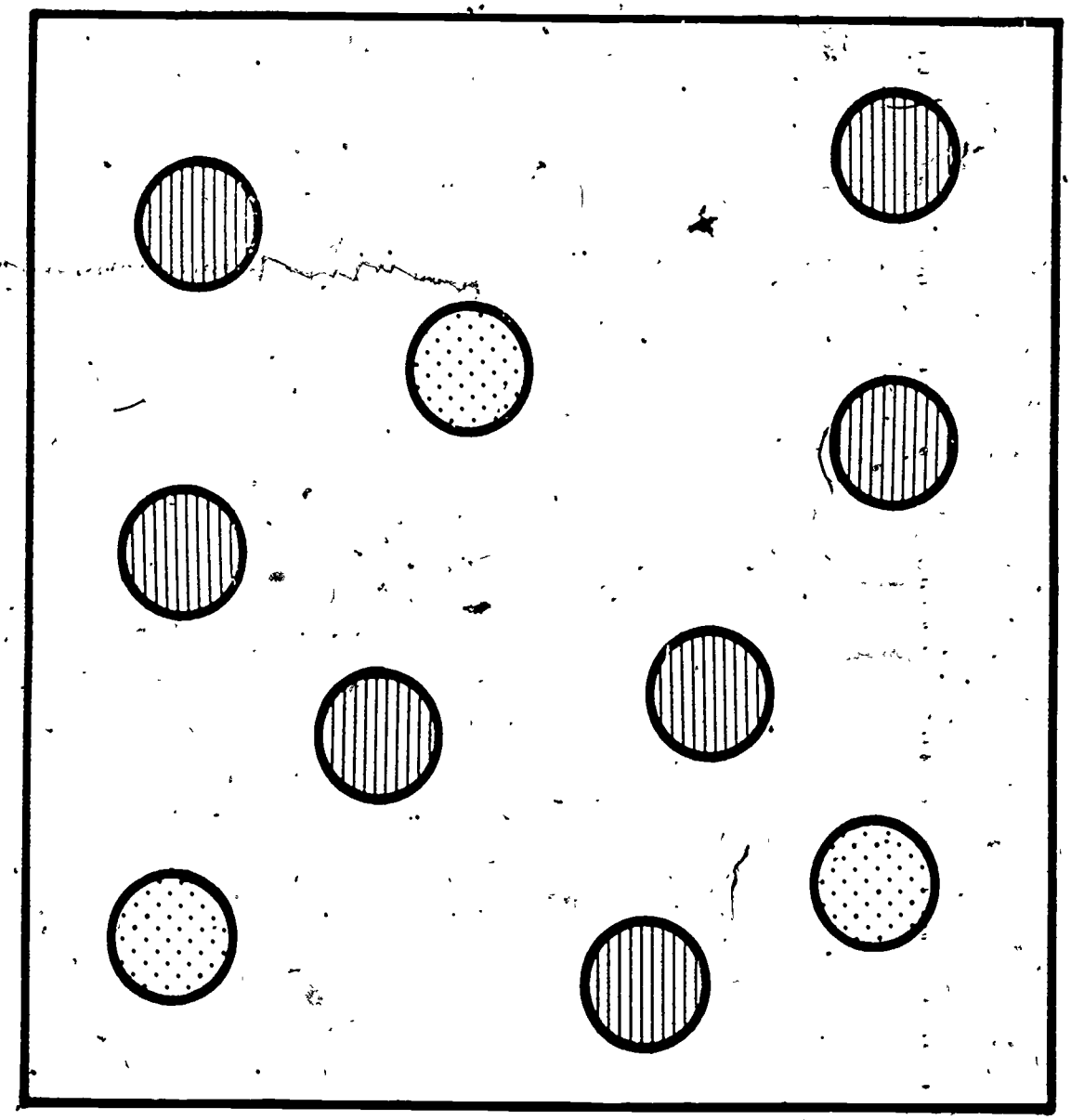
Multiple option system: $\bar{x}$ = 2.5 Traditional system: $\bar{x}$ = 2.5

Grade Level	White M	White F	Chicano M	Chicano F	Black M	Black F	Other M	Other F	White M	White F	Chicano M	Chicano F	Black M	Black F	Other M	Other F
2 $\bar{x}$= 2.4	2.35	2.63	2.28	2.49	2.64	2.50	2.00	3.06	2.29	2.60	2.13	2.24	1.96	2.18	2.13	3.17
3 $\bar{x}$= 2.5	2.23	2.22	2.25	2.42	2.55	2.37	2.57	2.22	2.53	2.75	2.20	2.35	2.67	2.56	2.88	2.86
4 $\bar{x}$= 2.5	2.49	2.58	2.29	2.54	2.66	2.82	2.81	2.39	1.99	2.53	2.40	2.57	2.60	2.64	2.78	2.00
5 $\bar{x}$= 2.5	2.10	2.31	2.45	2.63	2.37	2.58	2.50	2.56	2.03	2.55	2.46	2.51	2.85	2.49	2.56	2.56

White $\bar{x}$ = 2.38 Chicano $\bar{x}$ = 2.39 Black $\bar{x}$ = 2.52 Other $\bar{x}$ = 2.56

Source of variation	F	p
School type	0.01	N.S.
Ethnicity	2.73	p = .08
Sex	4.08	p = .04
Grade Level	0.36	N.S.

Scoring: Scores on these items can only be 1 or 0, depending on what sort of circle the student has chosen to mark by an X. If the circle marked by X is different from most of the other circles, give a score of 1. If the circle marked by X is the same as most of the other circles, give a score of 0.



19. All of the circles within the square stand for people. Put an X on one of the circles to stand for Yourself.

(perceived individuation)

Perceived individuation (range = 0 - 2)

Multiple option system: $\bar{x}$ = 1.40 Traditional system: $\bar{x}$ = 1.30

Grade Level	White M	White F	Chicano M	Chicano F	Black M	Black F	Other M	Other F	White M	White F	Chicano M	Chicano F	Black M	Black F	Other M	Other F
2 $\bar{x}$= 1.26	1.38	1.22	1.37	1.40	1.25	1.14	1.31	1.31	1.16	1.23	1.29	1.23	1.18	1.27	1.13	1.13
3 $\bar{x}$= 1.30	1.54	1.44	1.51	1.44	1.47	1.39	1.57	1.57	1.25	1.18	1.31	1.32	1.07	1.10	1.75	1.75
4 $\bar{x}$= 1.42	1.28	1.45	1.41	1.41	1.39	1.34	1.39	1.39	1.13	1.25	1.45	1.52	1.68	1.40	1.77	1.78
5 $\bar{x}$= 1.43	1.41	1.50	1.36	1.38	1.42	1.43	1.75	1.75	1.35	1.24	1.36	1.39	1.19	1.15	1.45	1.44

White $\bar{x}$ = 1.32 Chicano $\bar{x}$ = 1.38 Black $\bar{x}$ = 1.31 Other $\bar{x}$ = 1.40

Source of variation	F	p
School type	7.09	p = .008
Ethnicity	1.506	N.S.
Sex	0.171	N.S.
Grade Level	4.85	p = .003
School type X grade	3.98	p = .008
Ethnicity X grade	1.98	p = .04